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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.           | CONFIRMATION NO. |
|--|-------------|----------------------|-------------------------------|------------------|
| 09/853,475   | 05/11/2001  | James E. Justiss     | PD-200065 (BOE 0173<br>PA)    | 6670             |
| 7590   | 04/15/2004  |                      | EXAMINER<br>MEHRPOUR, NAGHMEH |                  |
| Kevin G. Mierzwa<br>Artz & Artz, P.C.<br>Suite 250<br>28333 Telegraph Road<br>Southfield, MI 48034 |             |                      | ART UNIT<br>2686              | PAPER NUMBER     |

DATE MAILED: 04/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/853,475

Applicant(s)

JUSTISS ET AL.

Examiner

Naghmeh Mehrpour

Art Unit

2686

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____.  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> . | 6) <input type="checkbox"/> Other:  |

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities:
  1. The “feedforward ” signal, should be corrected to “feed back ” signal.
    - a. in the figure 1, “signal 34” is a “feed back signal” not a “feed forward signal”.
    - b. in the figure 3, “signal 62” is a “feed back signal” not a “feed forward signal”.
  2. The figure 1, numbers are not consistent with the specification.
    - a. the in figure 1, number ‘24’ is referred as the correlator, but in the specification the error signal is referred as number “24”.
    - b. in figure 1, number “26” is referred as the error signal, but in the specification the correlator is referred as “26”.

Appropriate correction is required.

### *Claim Objections*

2. Claims 1, 3-4, 10, 11, 12, are objected to because of the following informalities:

The “reference feedforward signal” is an error and should be corrected to “reference feed back signal”. Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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3. Claim 13, recites the limitation "interference reference" in line 8. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

5. Claims 1-2, 7-9, are rejected under 35 U.S.C. 102(e) as being anticipated by the admitted prior art.

Regarding claim 1, the admitted prior art teaches a method of digitally canceling interference on a received signal within a satellite payload comprising adaptively canceling interference on the received signal using an interference reference feedforward signal (see figure 1, page 1 section 0003).

Regarding claim 2, the admitted prior art teaches a method further comprising subtracting 32 an counter-interference signal 26 from the received signal to form a desired signal 34 (see figure 1, page 2 section 0005).

Regarding claim 7, the admitted prior art teaches a method wherein said adaptively canceling interference farther comprises digitally and accurately replicating the interference (see figure 1, page 2 section 0005).

Regarding claim 8, the admitted prior art teaches a method further comprising simultaneously digitally canceling interference on a plurality of received signals (see figure 1, page 2 section 0005).

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Regarding claim 9, the admitted prior art teaches a method further comprising sequentially digitally canceling interference on a plurality of received signals (see figure 1, section 0005).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3-6, 10-13, are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Cioffi et al. (US Patent Number 5,995,567).

Regarding claim 3, the admitted prior art fails to teach a method further comprising digitally processing said desired signal to generate said feed back interference reference signal. However Cioffi teaches a method further comprising digitally processing said desired signal to generate said feed back interference reference signal (see figure 6, col 11 lines 43-62). Since the admitted prior art and Cioffi both eliminating the RF noise, therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the above teaching of Coiffi with the admitted prior art, in order to compensate and eliminate the radio frequency interference from a radio frequency source that undesirably interferes with reception of data being transmitted over the satellite payload.

Regarding claim 4, the admitted prior art teaches a method further comprising correlating 24 said interference reference feedback signal to said desired signal to generate an error signal (see figure 1, page 2 section 0005).

Regarding claim 5, the admitted prior art teaches a method wherein adaptively canceling interference on the received signal 34 farther comprising

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generating said counter-interference signal 24 based on said error signal 26 to cancel said interference (see figure 1, page 2 section 0005).

Regarding claim 6, the admitted prior art teaches a method wherein adaptively canceling interference further comprises iteratively canceling interference on the received signal 34 until said error signal 26 equals zero (see figure 1, page 2 section 0005).

Regarding claim 10, the admitted prior art teaches a method of canceling interference within a satellite payload system comprising:

receiving a communication signal 14 having interference 20 (see figure 1, page 2 section 0005);

Converting said communication signal into the received signal (see figure 1, page 2 section 0005);

A Sub tractor or 32 subtracting a counter-interference signal 30 from the received signal 14 to form a desired signal 34;

A correlator 24 correlating said interference reference feedback signal 34 to said desired signal to generate an error signal 26 (see figure 1);

Adaptively canceling interference on the received signal 34 based on said error signal 26 by generating said counter-interference signal 30 to cancel said interference (see figure 1, page 2 section 0005, page 3 section 0007). The admitted prior art of specification fails to teach a method of digitally canceling interference in a received signal within a satellite payload comprising:

Digitally processing said desired signal to form an interference reference feedback signal. However Cioffi teaches digitally processing 506 desired signal to form an interference reference feedback signal V<sub>FD</sub> (COL 11 LINES 43-62). Since the admitted prior art and Cioffi both eliminating the RF noise, therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the above teaching of Coiffi with the admitted prior art, in order to compensate and eliminate the radio frequency interference from a radio frequency source that undesirably interferes with reception of data being transmitted over the satellite payload.

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Regarding claim 11, the admitted prior art teaches a satellite communication system (page 3 section 0007) comprising:

A first antenna 16 for receiving a communication signal 14 (page 3 section 0007);

A feedback signal 34 path electrically coupling said output to said second input 20, said feedback signal 34 path transferring said interference reference feedback signal 20 from said output to said second input 18. The admitted prior art fails to teach an analog-to-digital converter (ADC) electrically coupled to said first antenna, said ADC converting said communication signal to a received signal;

A satellite payload circuit comprising a first input, a second input, and an output, said first input is electrically coupled to said ADC;

Said satellite payload circuit digitally processing said received signal to form an interference reference feedback signal.

However Cioffi teaches an analog-to-digital converter 604 (ADC) electrically coupled to said first antenna 106 (see figures 1, 6), said ADC 604 converting said communication signal 108 to a received signal 118/VfD;

a circuit 600 (see figure 6) comprising:

a first input 108, a second input 512, and an output 118, said first input 108 is electrically coupled to said ADC 604 (see figure 6, col 11 lines 51-57);

said digital processor circuit 600 digitally processing 506 said received signal 108 to form an interference reference feedback signal VfD (see figure 6, col 11 lines 36-40, lines 60-62). Since the admitted prior art and Cioffi both eliminating the RF noise, therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the above teaching of Coiffi with the admitted prior art, in order to compensate and eliminate the radio frequency interference from a radio frequency source that undesirably interferes with reception of data being transmitted over the satellite payload.

Regarding claim 12, the admitted prior art teaches a system wherein said satellite payload circuit (page 3 section 0007). comprises:

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a correlator 24 electrically coupled to a subtractor 32, said correlator 24 comparing a interference reference feedback signal 20 to said desired signal to generate an error signal 26 (see figure 1, page 2 section 0005); and

a controller 28 electrically coupled to said correlator 24 and said subtractor 32 (see figure 1, page 2 section 0005),

said controller 28 adaptively canceling interference on said received signal based on said error signal 26 (see figure 1, page 2 section 0005)

The admitted prior art fails to teach a system wherein

a subtractor electrically coupled to said ADC, said subtractor subtracting a counter-interference signal from said received signal to form a desired signal;

a digital processor electrically coupled to said subtractor, said digital processor generating said interference reference feed back signal from said desired signal.

However Cioffi teaches a system (see figure 6) wherein:

a subtractor 602 electrically coupled to said ADC 604, said subtractor 602 subtracting a counter-interference signal 30 from said received signal 14 to form a desired signal 34;

a digital processor 506 electrically coupled to said subtractor 602, said digital processor generating said interference reference feed back signal VfD from said desired signal 118. Since the admitted prior art and Cioffi both eliminating the RF noise, therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the above teaching of Cioffi with the admitted prior art, in order to compensate and eliminate the radio frequency interference from a radio frequency source that undesirably interferes with reception of data being transmitted over the satellite payload.

Regarding claim 13, the admitted prior art teaches a communication system (see figure 1, page 0005) comprising:

a first antenna 12 for receiving a communication signal 14 (see figure 1);



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a correlator 26 electrically coupled to said subtractor 32, said correlator comparing said interference reference signal 20 to said desired signal 32 to generate an error signal 30 (see figure 1, page 2 section 0005); and

a controller 28 electrically coupled to said correlator 26 and said subtractor 32, said controller adaptively canceling interference 20 on said received signal based on said error signal 24 (see figure 1, page section 0005).

The admitted prior art fails to teach that an analog-to-digital converter (ADC) electrically coupled to said first antenna, said ADC converting said communication signal to a received signal;

a subtractor electrically coupled to said ADC, said subtractor subtracting a counter-interference signal from said received signal to form a desired signal;

a digital processor electrically coupled to said subtractor, said digital processor generating said interference reference feed back signal from said desired signal.

However Cioffi teaches removing the noise from received signals by adaptively estimating the radio frequency noise during data transmission when even no data has been transmitted (col 3 lines 27-32). Cioffi teaches an analog-to-digital converter 604 (ADC) electrically coupled to a first antenna 106 (see figure 1), and the ADC 604 converting said communication signal 108 to a received signal 118 (col 11 lines 46-63);

a subtractor 602 electrically coupled to said ADC 604, said subtractor 602 subtracting a counter-interference signal 512 from said received signal 108 to form a desired signal 118 (see figure 6, col 11 lines 45-61);

a digital processor 506 electrically coupled to said subtractor 602, said digital processor 506 generating said interference reference 512 feed

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back signal from said desired signal 118 (see figure 6). Since the admitted prior art and Cioffi both eliminating the RF noise, therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the above teaching of Coiffi with the admitted prior art, in order to compensate and eliminate the radio frequency interference from a radio frequency source that undesirably interferes with reception of data being transmitted over the satellite payload.

### **Conclusion**

7. The prior art made of record and not relied upon is considered pertinent to applicants disclosure.

**Tuutijarvi et al.** (US Patent 5,809,399) disclose method and circuit for filtering disturbances un a radio receiver

**Zvinar** (US Patent 6,504,884 B1) disclose method for correcting DC offsets

**Agahi-Kesheh** (US Patent Number 6,430,402 B1) disclose power amplifier saturation prevention method apparatus and communication system incorporating the same

**Mangee** (US Patent Number 6,563,885 B1) disclose decimated noise estimated and/or beam forming for wireless communication

8. **Any responses to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

**or faxed to:**

(703) 872-9314, (for formal communications indented for entry)

**Or:**

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(703) 308-6306, (for informal or draft communications, please label

"PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, Va., sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Melody Mehrpour whose telephone number is (703) 308-7159. The examiner can normally be reached on Monday through Thursday (first week of bi-week) and Monday through Friday (second week of bi-week) from 6:30 a.m. to 5:00 p.m.

If attempt to reach the examiner are unsuccessful the examiner supervisor, Marsha Banks-Harold be reached (703)305-4379.

NM

Feb 3, 2004

*Marsha D Banks-Harold*  
MARSHA D BANKS-HAROLD  
SUPERVISORY TECHNOLOGICAL EXAMINER  
TECHNOLOGY CENTER 2600